

CLAIMS

1. An image processing apparatus comprising:

a pattern table which stores a plurality of screen patterns which include a predetermined number of

5 pattern data and have different data patterns;

an in-pattern position calculator which generates an in-pattern position signal indicating a position of an input image signal in said screen pattern from a main scanning synchronizing signal and a sub scanning  
10 synchronizing signal;

a pattern selecting signal combining section which generates a pattern selecting signal for selecting a specified pattern in said pattern table from said input image signal, combines the pattern selecting signal  
15 with said in-pattern position signal supplied from said in-pattern position calculator, and supplies an address in the pattern table; and

a pattern table reading section which reads pattern data corresponding to the address in said  
20 pattern table from said pattern table and supplying image data.

2. The apparatus according to claim 1, wherein said pattern data read from said pattern table by said pattern table reading section is a pulse width signal,

25 said apparatus further comprises:

a reference position table which stores reference position data for defining a position in a pixel in

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which the image corresponding to the pulse width signal read from said pattern table is to be formed;

5 a reference position table reading section which reads said reference position data in said reference position table based on said in-pattern position signal supplied from said in-pattern position calculator, and outputs a pulse position signal; and

10 a signal combining section which combines said pulse width signal read by said pattern table reading section and said pulse position signal read from the reference position table, and generates an image signal having a width corresponding to said pulse width signal in said reference position in each pixel.

3. An image processing apparatus comprising:

15 a pattern table which stores a plurality of screen patterns including a predetermined number of pattern data and having different data patterns;

20 an in-pattern position calculator which generates an in-pattern position signal indicating a position of an input image signal in said screen pattern from a main scanning synchronizing signal and a sub scanning synchronizing signal;

25 a pattern selecting signal combining section which generates a pattern selecting signal for selecting a specified pattern in said pattern table from said input image signal, and calculates an address in the pattern table and data for interpolation for use in an

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interpolation processing from the pattern selecting signal and said in-pattern position signal supplied from said in-pattern position calculator;

an interpolation original data reading section  
5 which reads two consecutive pattern data in an address space of said pattern table as interpolation original data from said pattern table based on the address in said pattern table calculated by said pattern selecting signal combining section; and

10 an interpolation processor which uses said data for interpolation calculated by said pattern selecting signal combining section, subjects said two interpolation original data read by said interpolation original data reading section to the interpolation  
15 processing, and supplies a result of the interpolation processing as image data.

4. The apparatus according to claim 3, wherein said interpolation processor provides said interpolation processing result as a pulse width  
20 signal,

said apparatus further comprising:

a reference position table which stores reference position data for defining a position in a pixel in which the image corresponding to the pulse width signal  
25 read from said interpolation processor is to be formed;

a reference position table reading section which reads said reference position data in said reference

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position table based on said in-pattern position signal supplied from said in-pattern position calculator, and outputs a pulse position signal; and

5 a signal combining section which combines said pulse width signal read by said interpolation processor and said pulse position signal read from the reference position table, and generates an image signal having a width corresponding to said pulse width signal in said reference position in each pixel.

10 5. The apparatus according to claim 2, further comprising:

15 a block averaging processor which divides the inputted image into blocks based on the main scanning synchronizing signal and the sub scanning synchronizing signal, performs an averaging processing of the image data with respect to each block, and outputs the image data subjected to the averaging processing; and

20 a  $\gamma$  correcting selection which subjects an image signal outputted from the block averaging section to  $\gamma$  correction and outputting an  $\gamma$ -corrected image signal, wherein said  $\gamma$ -corrected image signal outputted from said  $\gamma$  correcting selection is supplied to said pattern selecting signal combining section.

25 6. The apparatus according to claim 2, further comprising:

a  $\gamma$  correcting selection which subjects an inputted image signal to  $\gamma$  correction and outputs

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an  $\gamma$ -corrected image signal; and

a block averaging section which divides said  $\gamma$ -corrected image outputted from said  $\gamma$  correcting section into blocks based on the main scanning  
5 synchronizing signal and the sub scanning synchronizing signal, performs an averaging processing of the image data with respect to each block, and outputs the image data subjected to the averaging processing, wherein the image data outputted from the block averaging section  
10 is supplied to said pattern selecting signal combining section.

7. The apparatus according to claim 1, further comprising:

a correspondence pattern change table which,  
15 disposed between said pattern selecting signal combining section and said pattern table, changes a correspondence between said input image signal and the pattern data in said pattern table, wherein the correspondence between said input image signal and said  
20 pattern data is changed by rewriting a content of a conversion table.

8. An image processing apparatus comprising:

a pattern table which stores a plurality of screen patterns which have different sizes;

25 a pattern size information table which stores size information for each said screen pattern;

an in-image position calculator which generates

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an in-image position signal indicating a position of  
an input image signal in an image from a main scanning  
synchronizing signal and a sub scanning synchronizing  
signal;

5           a pattern selecting signal combining section which  
reads the size information of the corresponding screen  
pattern from said pattern size information table based  
on the input image signal, and uses the size  
information and said in-image position signal to  
10          calculate an address in the pattern table; and

          a pattern table reading section which reads image  
data in said pattern table corresponding to the address  
in said pattern table.

9. An image processing apparatus comprising:

15          a channel dividing section which divides an image  
signal of a plurality of channels into the image  
signals of the respective channels;

          a pattern table which stores a plurality of screen  
patterns which include a predetermined number of  
20          pattern data and have different data patterns;

          an in-pattern position calculator which generates  
different in-pattern position signals indicating  
positions of the input image signals in said screen  
pattern for the respective channels from a main  
25          scanning synchronizing signal and a sub scanning  
synchronizing signal;

          a pattern selecting signal combining section which

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generates a pattern selecting signal for selecting a specified pattern in said pattern table for each channel from the input image signal supplied from said channel dividing section, combines the pattern  
5 selecting signal with the in-pattern position signal supplied for each channel from said in-pattern position calculator, and supplies an address in said pattern table for each channel; and

10 a pattern table reading section which reads pattern data corresponding to the address in the pattern table of each channel from said pattern table and supplying image data.

10. An image processing apparatus comprising:

15 a first pattern table which stores a plurality of screen patterns which include a first predetermined number of pattern data and have different data patterns;

20 a second pattern table which stores a plurality of screen patterns which include a second predetermined number of pattern data and have different data patterns;

25 a first in-pattern position calculator which generates an in-pattern position signal indicating a position of an input image signal in the screen pattern in said first pattern table from a main scanning synchronizing signal and a sub scanning synchronizing signal;

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a second in-pattern position calculator which generates an in-pattern position signal indicating the position of the input image signal in the screen pattern in said second pattern table from the main scanning synchronizing signal and the sub scanning synchronizing signal;

a first pattern selecting signal combining section which generates a pattern selecting signal for selecting a specified pattern in said first pattern table from said input image signal, combines the pattern selecting signal with said in-pattern position signal supplied from said first in-pattern position calculator, and supplies an address in said first pattern table;

a second pattern selecting signal combining section which generates the pattern selecting signal for selecting the specified pattern in said second pattern table from said input image signal, combines the pattern selecting signal with said in-pattern position signal supplied from said second in-pattern position calculator, and supplies the address in said second pattern table;

a first pattern table reading section which reads pattern data corresponding to the address in said first pattern table from said first pattern table and supplying image data;

a second pattern table reading section which reads

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pattern data corresponding to the address in said  
second pattern table from said second pattern table and  
supplies the image data; and

5 a signal selecting section which selects and  
outputs one of the image data supplied from said first  
and second pattern table reading sections in response  
to an inputted pattern table change signal.

10 11. The apparatus according to claim 1, wherein  
the image data read from said pattern table in response  
to the same in-pattern position signal monotonously  
changes with a size of said pattern selecting signal.

15 12. The apparatus according to claim 3, wherein  
the image data read from said pattern table in response  
to the same in-pattern position signal monotonously  
changes with a size of said pattern selecting signal.

20 13. The apparatus according to claim 1, wherein  
the image data read from said pattern table in response  
to the same in-pattern position signal changes an  
increase/decrease direction in at least one portion in  
accordance with a size of said pattern selecting  
signal.

25 14. The apparatus according to claim 3, wherein  
the image data read from said pattern table in response  
to the same in-pattern position signal changes an  
increase/decrease direction in at least one portion in  
accordance with a size of said pattern selecting  
signal.

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15. The apparatus according to claim 1, further comprising:

a scanner section which optically reads a draft, and supplies the image signal corresponding to a draft image to said pattern selecting signal combining section; and

a printer section which forms the image on a copying paper based on the image data supplied from said pattern table reading section.

16. The apparatus according to claim 2, further comprising:

a scanner section which optically reads a draft, and supplies the image signal corresponding to a draft image to said pattern selecting signal combining section; and

a printer section which forms the image on a copying paper based on the image data supplied from said signal combining section.

17. The apparatus according to claim 3, further comprising:

a scanner section which optically reads a draft, and supplies the image signal corresponding to a draft image to said pattern selecting signal combining section; and

a printer section which forms the image on a copying paper based on the image data supplied from said signal combining section.

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18. An image processing method comprising the steps of:

storing a plurality of screen patterns which include a predetermined number of pattern data and have  
5 different data patterns as a pattern table in a storage;

generating an in-pattern position signal indicating a position of an input image signal in said screen pattern from a main scanning synchronizing  
10 signal and a sub scanning synchronizing signal;

generating a pattern selecting signal for selecting a specified pattern in said pattern table from said input image signal, combining the pattern selecting signal with said in-pattern position signal,  
15 and supplying an address in the pattern table; and

reading pattern data corresponding to the address in said pattern table from said pattern table and supplying image data.

19. The method according to claim 18, wherein said  
20 pattern data read from said pattern table is a pulse width signal,

said method further comprises:

storing reference position data for defining a position in a pixel in which the image corresponding to  
25 the pulse width signal read from said pattern table is to be formed as a reference position table in a storage;

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reading said reference position data in said  
reference position table based on said in-pattern  
position signal, and outputting a pulse position  
signal; and

5 combining said pulse width signal and said pulse  
position signal, and generating an image signal having  
a width corresponding to said pulse width signal in  
said reference position in each pixel.

20. An image processing method comprising the  
10 steps of:

storing a plurality of screen patterns including  
a predetermined number of pattern data and having  
different data patterns as a pattern table in  
a storage;

15 generating an in-pattern position signal  
indicating a position of an input image signal in said  
screen pattern from a main scanning synchronizing  
signal and a sub scanning synchronizing signal;

generating a pattern selecting signal for  
20 selecting a specified pattern in said pattern table  
from said input image signal, and calculating an  
address in the pattern table and data for interpolation  
for use in an interpolation processing from the pattern  
selecting signal and said in-pattern position signal;

25 reading two consecutive pattern data in an address  
space of said pattern table as interpolation original  
data from said pattern table based on the address in

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said pattern table; and

using said data for interpolation, subjecting said  
two interpolation original data to the interpolation  
processing, and supplying a result of the interpolation  
5 processing as image data.

21. The method according to claim 20, wherein said  
step of performing the interpolation processing  
comprises a step of providing said interpolation  
processing result as a pulse width signal,

10 said method further comprising:

storing reference position data for defining a  
position in a pixel in which the image corresponding to  
said pulse width signal is to be formed as a reference  
position table in a storage;

15 reading said reference position data in said  
reference position table based on said in-pattern  
position signal, and outputting a pulse position  
signal; and

20 combining said pulse width signal and said pulse  
position signal, and generating an image signal having  
a width corresponding to said pulse width signal in  
said reference position in each pixel.

22. An information storage medium which includes  
a program comprising the steps of:

25 storing a plurality of screen patterns which  
include a predetermined number of pattern data and have  
different data patterns as a pattern table in

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a storage;

generating an in-pattern position signal  
indicating a position of an input image signal in said  
screen pattern from a main scanning synchronizing  
5 signal and a sub scanning synchronizing signal;

generating a pattern selecting signal for  
selecting a specified pattern in said pattern table  
from said input image signal, combining the pattern  
selecting signal with said in-pattern position signal,  
10 and supplying an address in the pattern table; and

reading pattern data corresponding to the address  
in said pattern table from said pattern table and  
supplying image data.

23. The information storage medium according to  
15 claim 22, wherein said pattern data read from said  
pattern table is a pulse width signal,

the program further comprises:

storing reference position data for defining a  
position in a pixel in which the image corresponding to  
20 the pulse width signal supplied from said pattern table  
is to be formed as a reference position table in a  
storage;

reading said reference position data in said  
reference position table based on said in-pattern  
25 position signal, and outputting a pulse position  
signal; and

combining said pulse width signal and said pulse

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position signal, and generating an image signal having a width corresponding to said pulse width signal in said reference position in each pixel.

24. An information storage medium which includes a  
5 program comprising the steps of:

storing a plurality of screen patterns including a predetermined number of pattern data and having different data patterns as a pattern table in a storage;

10 generating an in-pattern position signal indicating a position of an input image signal in said screen pattern from a main scanning synchronizing signal and a sub scanning synchronizing signal;

generating a pattern selecting signal for  
15 selecting a specified pattern in said pattern table from said input image signal, and calculating an address in the pattern table and data for interpolation for use in an interpolation processing from the pattern selecting signal and said in-pattern position signal;

20 reading two consecutive pattern data in an address space of said pattern table as interpolation original data from said pattern table based on the address in said pattern table; and

using said data for interpolation, subjecting said  
25 two interpolation original data to the interpolation processing, and supplying a result of the interpolation processing as image data.

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25. The information storage medium according to claim 24, wherein said step of performing the interpolation processing comprises a step of providing said interpolation processing result as a pulse width  
5 signal,

the program further comprises:

storing reference position data for defining a position in a pixel in which the image corresponding to said pulse width signal is to be formed as a reference  
10 position table in a storage;

reading said reference position data in said reference position table based on said in-pattern position signal, and outputting a pulse position signal; and

15 combining said pulse width signal and said pulse position signal, and generating an image signal having a width corresponding to said pulse width signal in said reference position in each pixel.

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